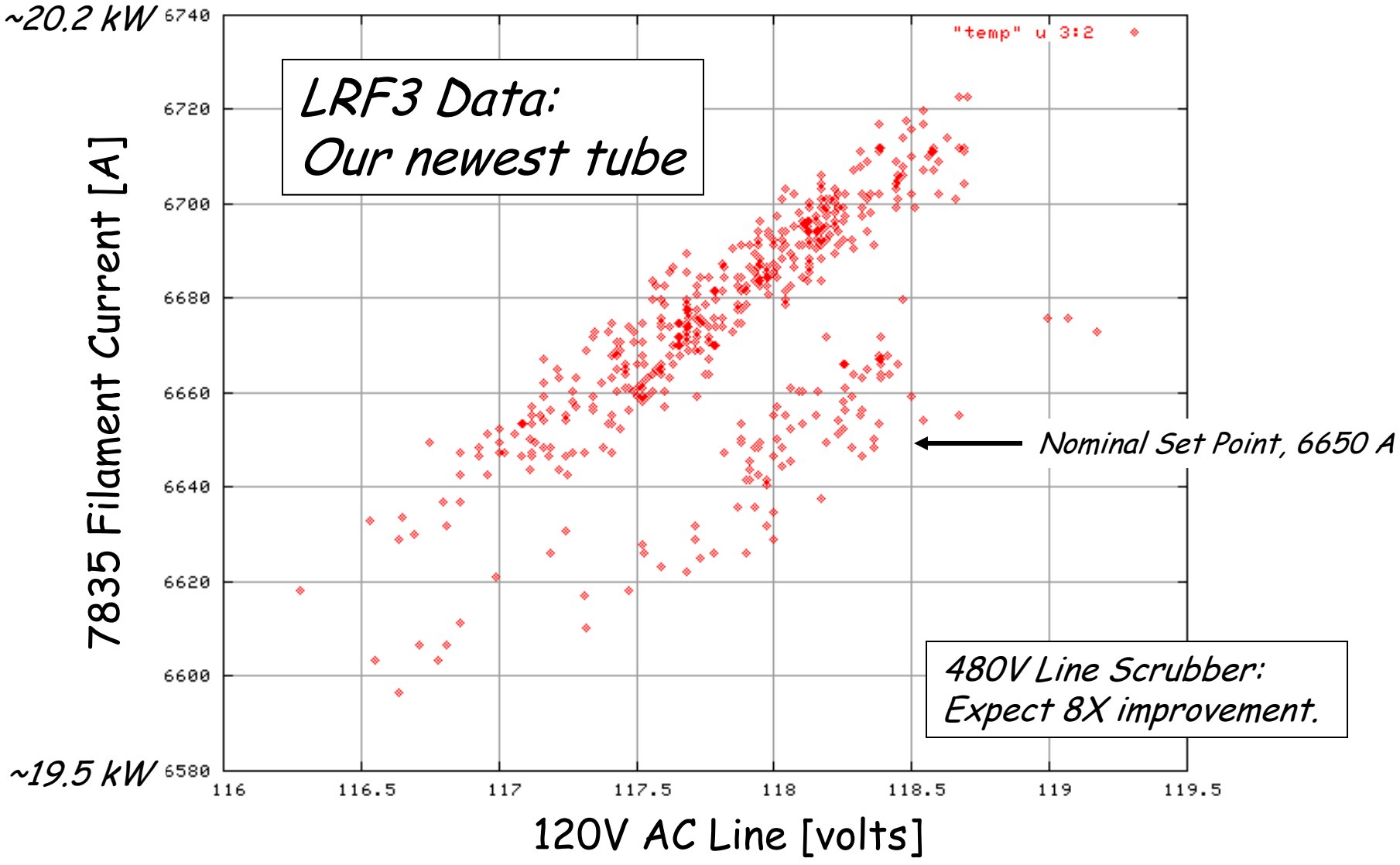
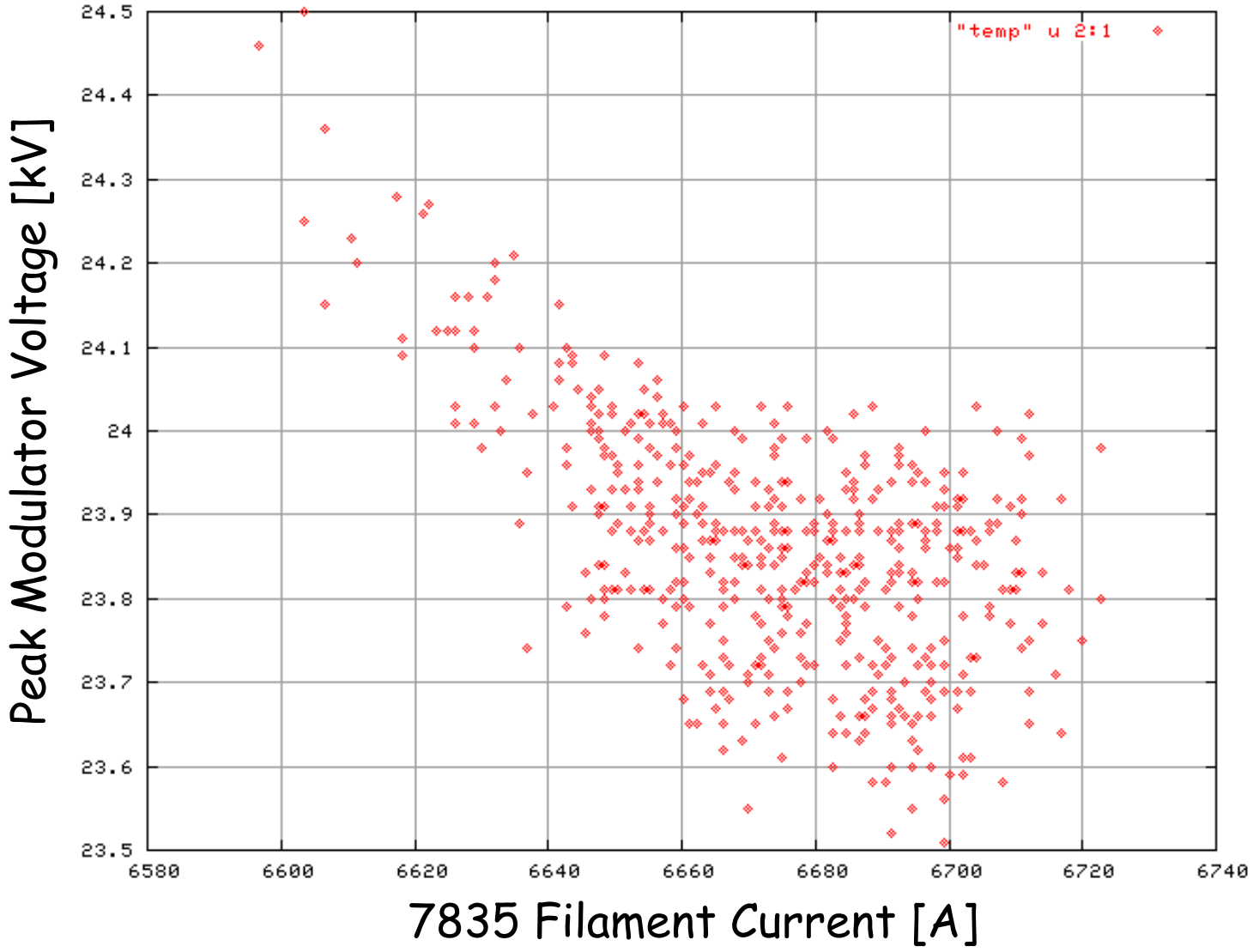
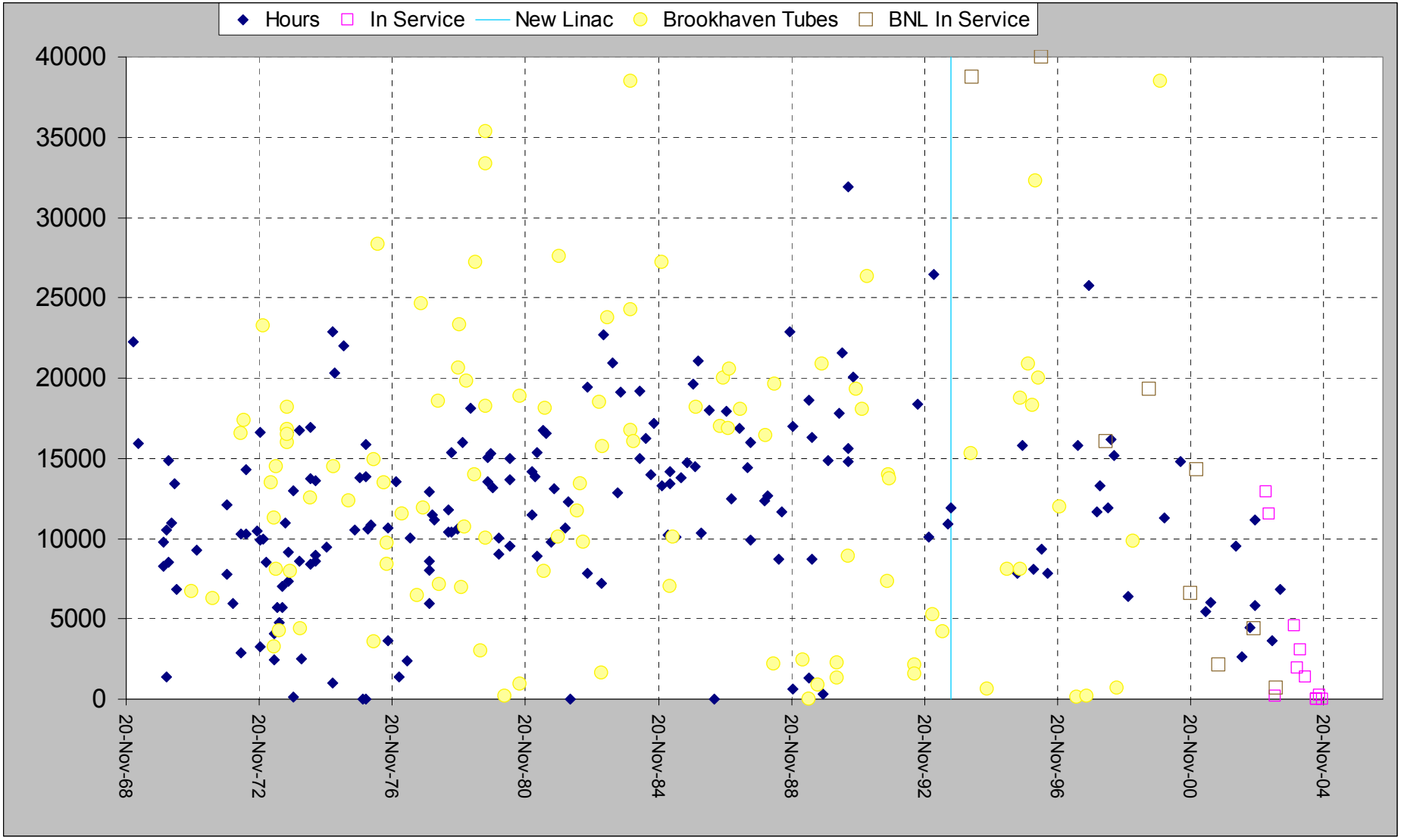
Line Voltage vs. 7835 Filament Current



Filament vs. Modulator Voltage



Tube Life: FNAL and BNL



Tubes Since 11/2000

- BNL has received three tubes
  - All three are still in service
    - *None have extraordinary life compared to FNAL tubes of the same vintage,*
- FNAL has received 19 tubes
  - 9 have failed
  - 11 are still in service:
    - *5 are currently providing RF power to the Linac*
    - *2 are in standby ("spares")*
    - *3 have not been tested yet,*
    - *1 is probably going to be sent back to Burle under warrantee.*

3 Labs; Slightly Different Linacs

Item	FNAL	LANL	BNL
RF / Beam Duration	250 / 30 μsec	1000 μsec	750 / 500 μ sec
Repetition Rate	15 Hz	120 Hz	7.5 Hz
→RF / Beam Duty	0.4% / 0.06%	12%	0.6% / 0.4%
Peak Power	4.5 MW	2.9 MW	4.5 MW
Peak Current	40 mA	15 mA	0 - 35 mA*
→Ave current	24 μA	1800 μA	0 - 140 μA*
Sockets	5	4	9*
Hours/year	8000	7000	4000
Tube Lifetime	6-12K	15-30K	15-40K

* BNL operations: Two modes →

- Isotope production
  - *35 mA, 116 MeV beam,*
  - *Drift through tanks 6, 7, 8 and 9*
- Polarized Protons
  - *200 MeV*
  - *No beam loading*